DETECTION OF VIRAL AND VIROID DISEASES ASSOCIATED WITH CITRUS (*Citrus* spp.) CULTIVATIONS IN KURUNEGALA DISTRICT, SRI LANKA

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ABSTRACT

Citrus refers to a group of trees and shrubs belonging to the Rutaceae family, which is rich in nutrients and bioactive compounds. Some economically important citrus species are grown in various regions in Sri Lanka. Viral and viroid diseases are the major challenges for citrus production in Sri Lanka. Information on citrus viruses and viroids is scanty and outdated in Sri Lanka. No proper survey has been carried out to identify the different viruses present. This study aims to identify the viral and viroid diseases associated with citrus cultivations and characterize the viruses associated with citrus cultivations in Kurunegala district, Sri Lanka. For the detection of viral and viroid diseases, symptomatic leaf samples exhibiting symptoms of yellowing, leaf curling, vein clearing and stunted growth were tested by serological and molecular based techniques. Triple Antibody Sandwich ELISA (Compound ELISA) was performed for the detection of *Citrus tristeza virus* (CTV) and 76 positive samples were detected out of 100 samples in Kurunegala district. Furthermore, their identity was confirmed by RT-PCR using specific primers (CTV –AR18F and CTV – AR18R) and expected band size at 511 bp. Molecular detection by RT- PCR was conducted for detection of *Citrus tristeza virus* (CTV), *Citrus vein enation virus* (CVEV), *Citrus yellow mosaic virus* (CYMV), *Citrus yellow vein clearing virus* (CYVCV), *Citrus bent leaf viroid* (CBLVd), *Hop stunt viroid* (HSVd), and *Citrus viroid I* (CVd I LSS). Presence of the CTV was confirmed and amplified PCR products of CBLVd, and CVd I LSS were obtained for further confirmation. For the molecular characterization of viral and viroid diseases, *Citrus tristeza virus* sequence was confirmed with 99% of sequence identity over 464 base pairs and phylogenetic analysis revealed genetic variations among the *Citrus tristeza virus* p18 gene sequences and *Citrus vein enation virus*. These findings demonstrated the urgent need for continuous surveillance and effective disease management strategies to mitigate the impact of viral and viroid infections on citrus crops. Furthermore, the study offered crucial insight into the molecular detection of citrus pathogens in Kurunegala district to contribute to the development of sustainable disease control strategies for enhancing citrus productivity.

Keywords: Citrus viruses, Molecular detection, Phylogenetic analysis, Sri Lanka

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